FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

January 25 to January 31, 2015 (week 04)

Overall Summary

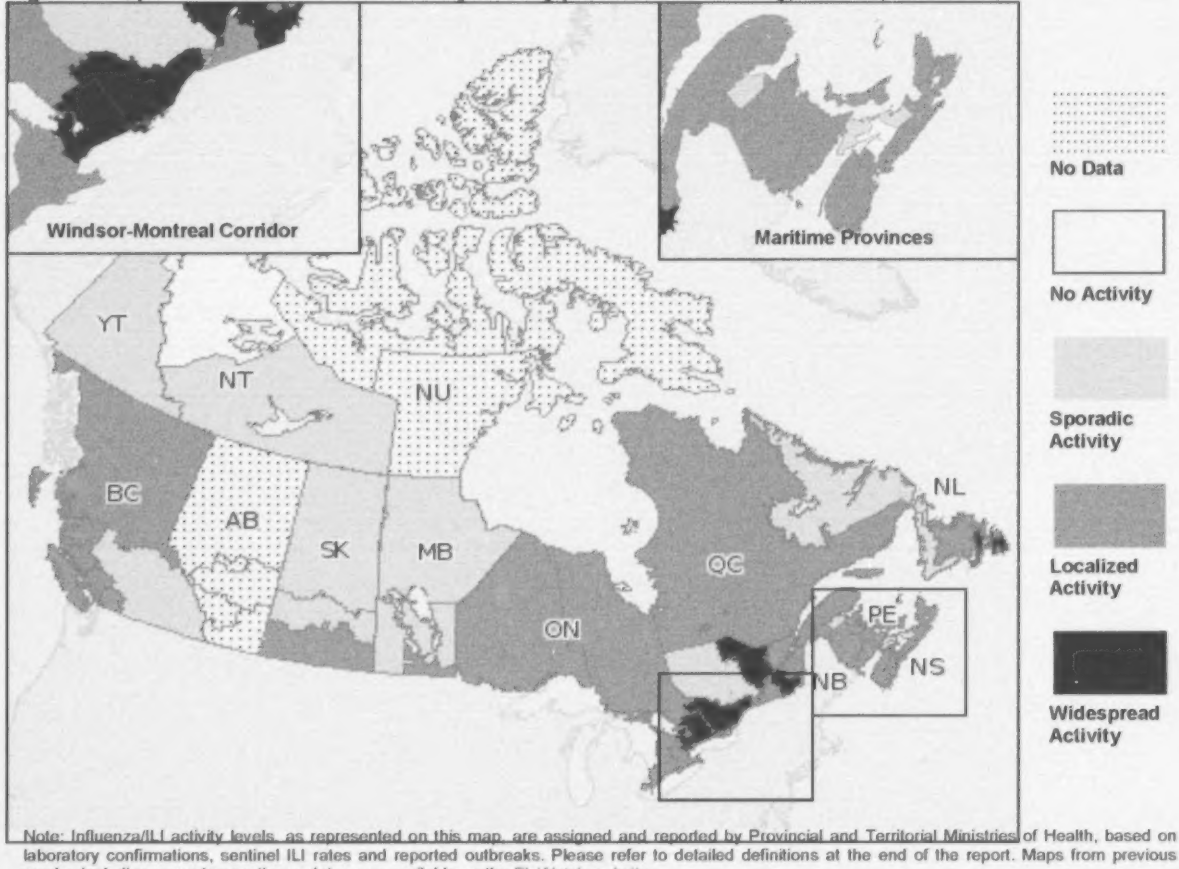
- In week 4, all influenza indicators continue to decline indicating that peak of the influenza season in Canada has passed.
- A(H3N2) continues to be the most common type of influenza affecting Canadians. In both laboratory detections, hospitalizations and deaths and the majority of cases have been among seniors ≥65 years of age.
- Detections of respiratory syncytial virus (RSV) continue to be the second most frequently detected virus after influenza. Since week 38, detections of RSV have been higher than in the previous season.
- On February 5, 2015, a Canadian interim vaccine effectiveness (VE) study by the PCIRN-SOS Network was published in *Eurosurveillance*. This study which examined VE for those seriously ill and in hospital found the overall VE for those under 65 years of age to be 11% and minus 25% for those over 65 years of age. Almost all (99%) cases were laboratory confirmed with H3N2. These poor VE estimates are not unexpected given the high degree of drift of the circulating virus from the vaccine strain observed in Canada this season.
- Evidence from the National Microbiology Laboratory does indicate that the other vaccine components will continue to provide protection against the circulating A(H1N1) and B strains.

Are you a primary health care practitioner (General Practitioner, Nurse Practitioner or Registered Nurse) interested in becoming a FluWatch sentinel for the 2014-15 influenza season? Contact us at FluWatch@phac-aspc.gc.ca

Influenza/ILI Activity (geographic spread)

In week 04, 6 regions reported widespread activity: in ON(3), QC(2), NF. Twenty-seven regions reported localized activity: in BC(4), SK, MB, ON(4), QC(3), NB(6), NS(6), NL and PEI and fifteen regions reported sporadic activity: in NWT, YK, BC, SK(2), MB(4), QC, NB, NS(2) and NF(2). NU and AB did not report data for week 04.

Figure 1. Map of overall influenza/ILI activity level by province and territory, Canada, Week 04

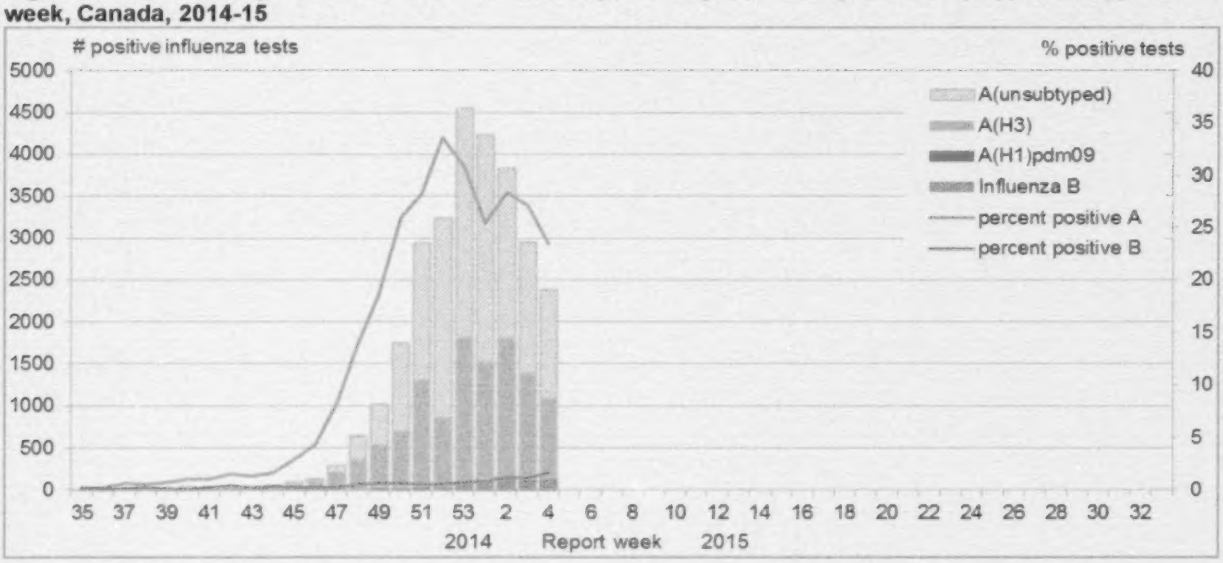


Note: Influenza/ILI activity levels, as represented on this map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, sentinel ILI rates and reported outbreaks. Please refer to detailed definitions at the end of the report. Maps from previous weeks, including any retrospective updates, are available on the FluWatch website.

Influenza and Other Respiratory Virus Detections

The number of positive tests decreased from 2,959 in week 03 to 2,388 in week 04. The percentage of positive influenza tests also decreased from 28.3% to 25.0% (Figure 2). To date, 97% of influenza detections have been influenza A, and 99.8% of those subtyped have been A(H3N2) (Table 1). To date this season, detailed information on age and type/subtype has been received for 25,918 cases. A significantly greater proportion of laboratory detections of influenza have been reported in adults ≥65 years of age (62%) this season (Table 2) compared to the 2013-14 season when only 15.5% of cases were in adults ≥65 years of age.

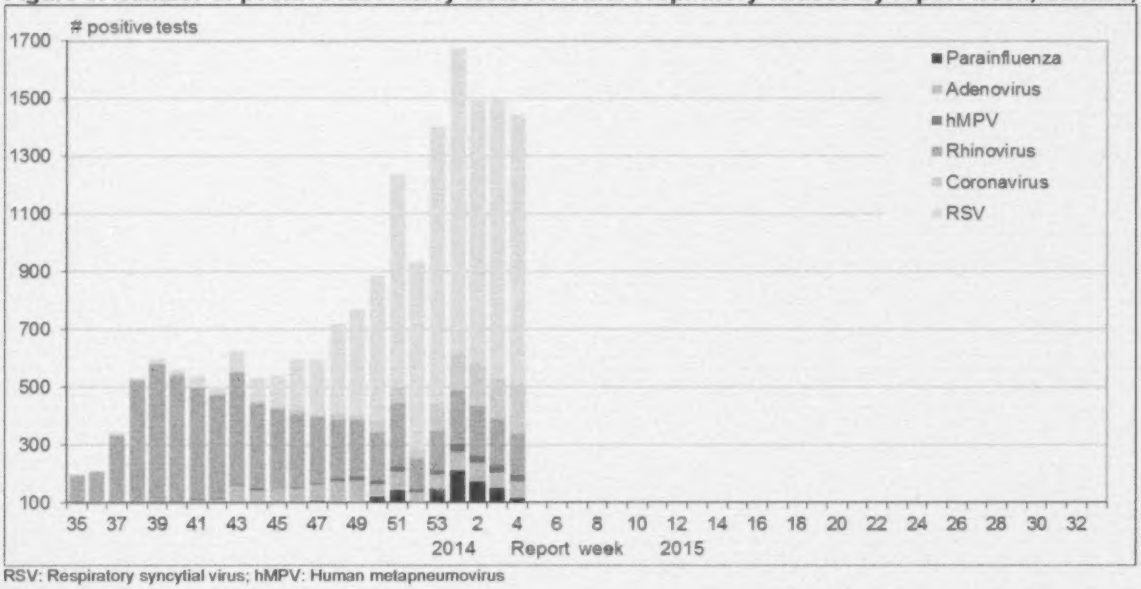
Figure 2. Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, 2014-15



In week 04, the number of positive respiratory syncytial virus (RSV) tests decreased to 936 RSV detections and remains the second most frequently detected virus after influenza. Detections of RSV since week 38 have been higher than in the previous season. During the past few weeks detections of other respiratory viruses have been relatively stable. Detections of other respiratory viruses have generally been lower this season compared to the previous season (Figure 3).

For more details, see the weekly Respiratory Virus Detections in Canada Report.

Figure 3. Number of positive laboratory tests for other respiratory viruses by report week, Canada, 2014-15



RSV: Respiratory syncytial virus; hMPV: Human metapneumovirus

Table 1. Weekly and cumulative numbers of positive influenza specimens by type, subtype and province, Canada, 2014-15

Reporting provinces[1]	Weekly (January 25 to January 31, 2015)					Cumulative (August 24, 2014 to January 31, 2015)				
	Influenza A				B	Influenza A				B
	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total
BC	314	3	252	59	13	2700	8	2067	625	71
AB	52	0	40	12	32	3410	2	3271	137	263
SK	30	0	0	34	2	1206	0	0	1206	13
MB	54	0	6	48	5	1011	0	357	654	24
ON	1,005	2	511	492	11	7819	10	3597	4212	93
QC	477	0	0	477	73	9720	3	422	9295	443
NB	149	0	41	108	9	426	0	66	360	17
NS	70	0	32	38	6	257	0	123	134	19
PE	13	0	13	0	0	60	1	57	2	1
NL	40	0	0	40	0	498	0	53	445	3
Canada	**2,204**	**5**	**895**	**1,308**	**151**	**27107**	**24**	**10013**	**17070**	**947**
Percentage[2]	93.6%	0.2%	40.6%	59.3%	6.4%	96.6%	0.1%	36.9%	63.0%	3.4%

Table 2. Weekly and cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting[3], Canada, 2014-15

Age groups (years)	Weekly (January 25 to January 31, 2015)					Cumulative (August 24, 2014 to January 31, 2015)						
	Influenza A				B	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	#	%
<5	84	0	8	76	14	1695	5	663	1027	86	1781	6.9%
5-19	73	1	14	58	19	1525	1	812	712	118	1643	6.3%
20-44	110	0	24	86	17	2879	5	1309	1565	139	3018	11.6%
45-64	139	0	31	108	27	3153	2	1247	1904	214	3367	13.0%
65+	552	1	119	432	35	15667	6	5838	9823	347	16014	61.8%
Unknown	15	0	13	2	0	93	0	78	15	2	95	0.4%
Total	973	2	209	762	112	25012	19	9947	15046	906	25918	100.0%
Percentage[2]	89.7%	0.2%	21.5%	78.3%	10.3%	96.5%	0.1%	39.8%	60.2%	3.5%		

[1] Specimens from NT, YT, and NU are sent to reference laboratories in other provinces. Cumulative data includes updates to previous weeks.
[2] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
[3] Table 2 includes specimens for which demographic information was reported. These represent a subset of all positive influenza cases reported.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Antiviral Resistance

During the 2014-2015 influenza season, the NML has tested 425 influenza viruses for resistance to oseltamivir and 424 influenza viruses for resistance to zanamivir and all were sensitive to both agents. A total of 692 (99.8%) influenza viruses were resistant to amantadine (Table 3).

Table 3. Antiviral resistance by influenza virus type and subtype, Canada, 2014-15

Virus type and subtype	Oseltamivir		Zanamivir		Amantadine	
	# tested	# resistant (%)	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	352	0	351	0	691	690 (99.9%)
A (H1N1)	2	0	2	0	2	2 (100%)
B	71	0	71	0	NA[1]	NA[1]
TOTAL	425	0	424	0	693	692

[1]NA: Not Applicable

Influenza Strain Characterizations

During the 2014-2015 influenza season, the National Microbiology Laboratory (NML) has characterized 151 influenza viruses [75 A(H3N2), 2 A(H1N1) and 74 influenza B].

Influenza A (H3N2): When tested by hemagglutination inhibition (HI) assay (n=75), one virus was antigenically similar to A/Texas/50/2012, five showed reduced titers to A/Texas/50/2012 and 69 were antigenically similar to A/Switzerland/9715293/2013, which is the influenza A(H3N2) component recommended for the 2015 Southern Hemisphere influenza vaccine. Additionally, 538 A(H3N2) viruses were unable to be tested by HI assay; however, sequence analysis showed that 536 belonged to a genetic group that typically shows reduced titers to A/Texas/50/2012. **Influenza A(H1N1):** Two A(H1N1) viruses characterized were antigenically similar to A/California/7/2009. **Influenza B:** Of the 74 influenza B viruses characterized, 67 viruses were antigenically similar to B/Massachusetts/2/2012, three viruses showed reduced titers against B/Massachusetts/2/2012, and four were B/Brisbane/60/2008-like (Figure 4).

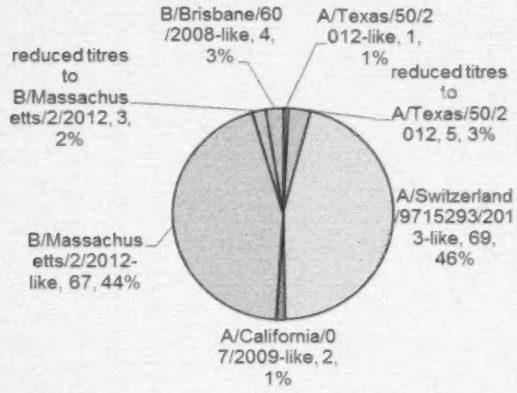


Figure 4. Influenza strain characterizations, Canada, 2014-15, N = 151

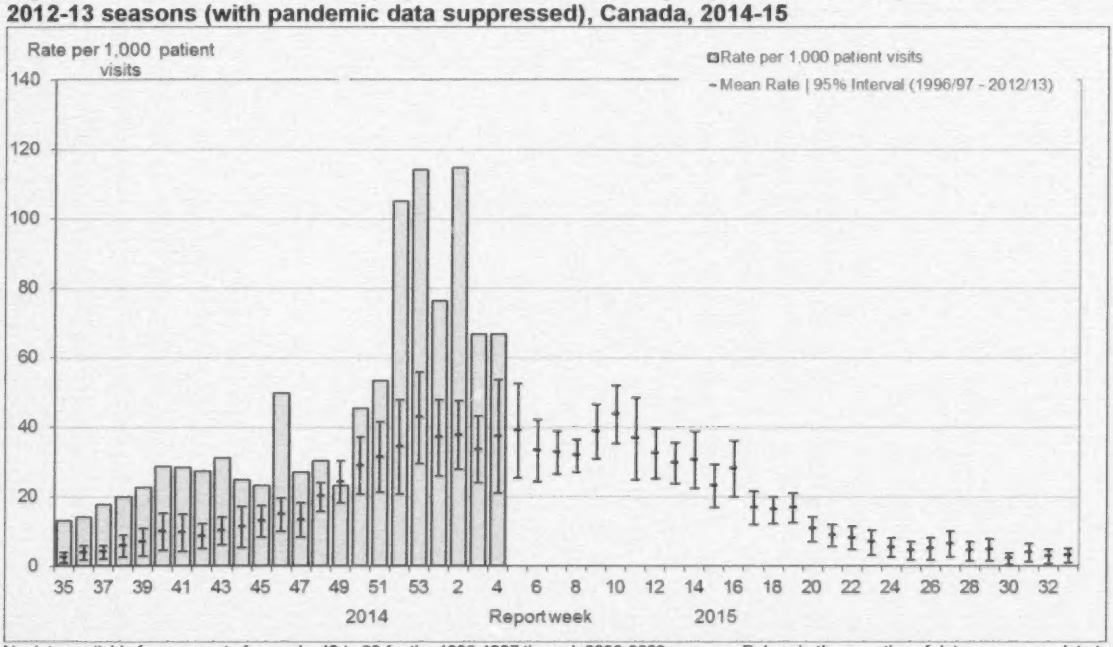
The NML receives a proportion of the number of influenza positive specimens from provincial laboratories for strain characterization and antiviral resistance testing. Characterization data reflect the results of haemagglutination inhibition (HAI) testing compared to the reference influenza strains recommended by WHO.

The recommended components for the 2014-2015 northern hemisphere trivalent influenza vaccine include: an A/California/7/2009(H1N1)pdm09-like virus, an A/Texas/50/2012 (H3N2)-like virus, and a B/Massachusetts/2/2012-like virus (Yamagata lineage). For quadrivalent vaccines, the addition of a B/Brisbane/60/2008-like virus is recommended.

Influenza-like Illness Consultation Rate

The national influenza-like-illness (ILI) consultation remained relatively the same as the previous week at 66.8 consultations per 1,000, which is above expected levels (Figure 5).

Figure 5. Influenza-like-illness (ILI) consultation rates by report week, compared to the 1996-97 through to 2012-13 seasons (with pandemic data suppressed), Canada, 2014-15

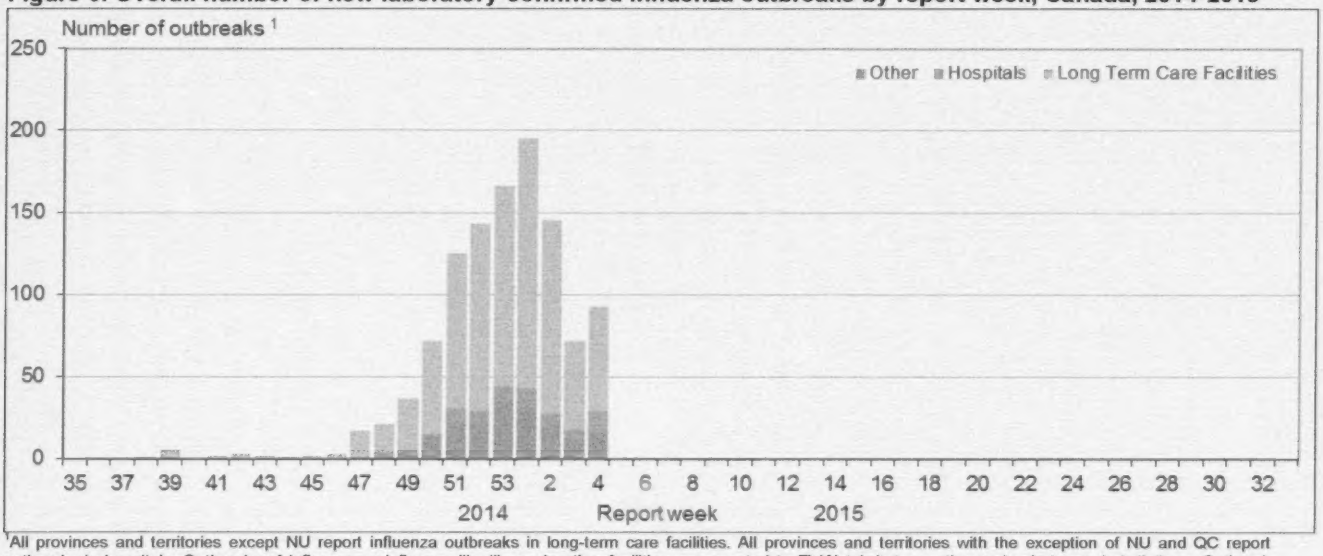


No data available for mean rate for weeks 19 to 39 for the 1996-1997 through 2002-2003 seasons. Delays in the reporting of data may cause data to change retrospectively. The calculation of the average ILI consultation rate over 17 seasons was aligned with influenza activity in each season. In BC, AB, and SK, data is compiled by a provincial sentinel surveillance program for reporting to FluWatch. Not all sentinel physicians report every week.

Influenza Outbreak Surveillance

In week 04, 93 new outbreaks of influenza were reported, up from the number of outbreaks reported in the previous week. Sixty-four outbreaks were reported in long-term care facilities (LTCF), 13 in hospitals and 16 in institutional or community settings (Figure 6). An additional 17 outbreaks of ILI were reported in schools. Among the outbreaks in which the influenza subtype was known, eight LTCF outbreaks and one institutional or community setting outbreak were associated with A(H3N2). To date this season, 859 outbreaks in LTCFs have been reported and the majority of those with known subtypes were attributable to A(H3N2). There has been a higher number of reported influenza outbreaks to date this season compared to the same period in previous seasons.

Figure 6. Overall number of new laboratory-confirmed influenza outbreaks by report week, Canada, 2014-2015

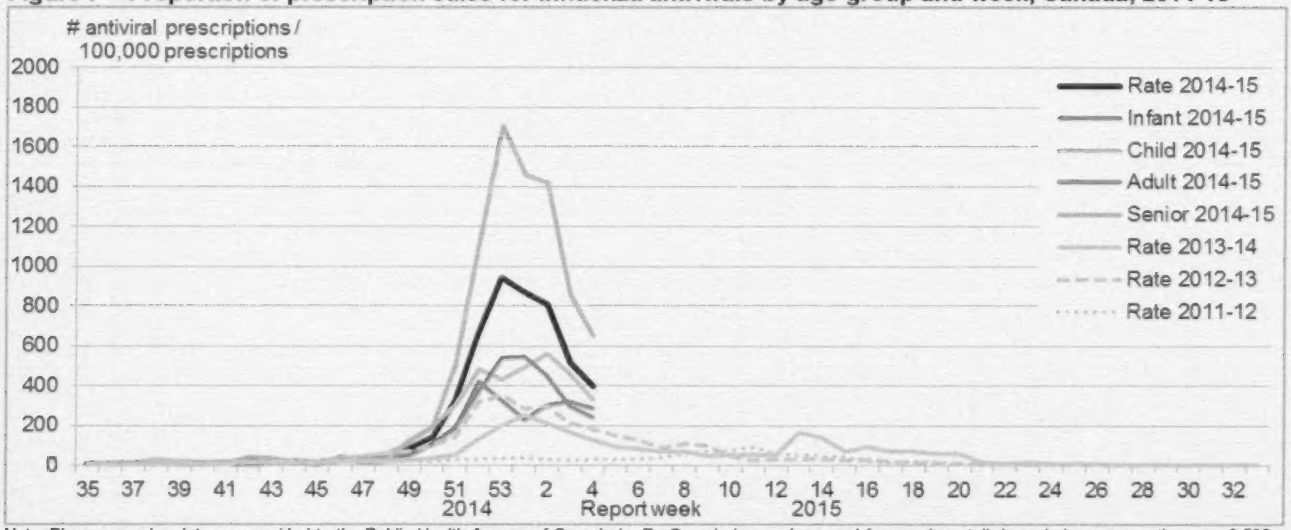


[1]All provinces and territories except NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals. Outbreaks of influenza or influenza-like-illness in other facilities are reported to FluWatch but reporting varies between jurisdictions. Outbreak definitions are included at the end of the report.

Pharmacy Surveillance

During week 04, the proportion of prescriptions for antivirals decreased to 395.7 antiviral prescriptions per 100,000 total prescriptions (down from 512.3 per 100,000). The rate for antivirals since week 48 has been higher than the previous three seasons (Figure 7). The rate in all age groups decreased in week 04. The antiviral prescription rate remains the highest amongst seniors at 650.0 per 100,000 total prescriptions.

Figure 7 – Proportion of prescription sales for influenza antivirals by age-group and week, Canada, 2014-15



Note: Pharmacy sales data are provided to the Public Health Agency of Canada by Rx Canada Inc. and sourced from major retail drug chains representing over 2,500 stores nationwide (excluding Nunavut) in 85% of Health Regions. Data provided include the number of new antiviral prescriptions (for Tamiflu and Relenza) and the total number of new prescriptions dispensed by Province/Territory and age group. Age-groups: Infant: 0-2y, Child: 2-18y; Adult: 19-64y, Senior: ≥65y

Sentinel Hospital Influenza Surveillance

Paediatric Influenza Hospitalizations and Deaths (IMPACT)

In week 04, 23 laboratory-confirmed influenza-associated paediatric (≤16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network: 22 cases of influenza A and one case of influenza B (Figure 8a). Among the reported cases, 5 (22%) were <2 years of age, 13 (56%) were 2 to 9 years of age and five (22%) were 10-16 years of age. Two cases were admitted to the ICU. To date this season, 467 hospitalizations have been reported by the IMPACT network, 441 (94%) of which were cases of influenza A. Among cases for which the influenza A subtype was reported, 99% (139/141) were A(H3N2) (Table 4). To date, 53 cases were admitted to the ICU, of which 33 (60%) were 2 to 9 years of age (Figure 9a). Three deaths have been reported.

Note: The number of hospitalizations reported through IMPACT represents a subset of all influenza-associated paediatric hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Adult Influenza Hospitalizations and Deaths (PCIRN)

In week 04, 78 laboratory-confirmed influenza-associated adult (≥16 years of age) hospitalizations were reported by the PHAC/CIHR Influenza Research Network (PCIRN) Serious Outcomes Surveillance (SOS) network. Among the cases in week 04, 63 cases (81%) were in adults over the age of 65 and 74 cases (95%) had influenza A (Figure 8b). To date this season, 1,411 cases have been reported; 1,392 (99%) with influenza A. The majority of cases (83%) were among adults ≥65 years of age (Table 5). One hundred ICU admissions have been reported and 76 cases were adults ≥65 years of age. A total of 79 ICU cases reported to have at least one underlying condition or comorbidity. Of the 74 ICU cases with known immunization status, 24 (32%) reported not having been vaccinated this season. Sixty-four deaths have been reported, 57 (89%) of the deaths were adults >65 years of age (Figure 9b).

Note: The number of hospitalizations reported through PCIRN represents a subset of all influenza-associated adult hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Table 4 – Cumulative numbers of paediatric hospitalizations with influenza reported by the IMPACT network, Canada, 2014-15

Age groups	Cumulative (24 Aug. 2014 to 31 Jan. 2015)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)[2]	Total	# (%)
0-5m	68	0	14	54	2	70 (15.0%)
6-23m	96	1	30	65	11	107 (22.9%)
2-4y	106	1	35	70	4	110 (23.6%)
5-9y	113	0	39	74	6	119 (25.5%)
10-16y	58	0	21	37	3	61 (13.1%)
Total	441	2	139	300	26	467
% [1]	94.4%	0.5%	31.5%	68.0%	5.6%	100.0%

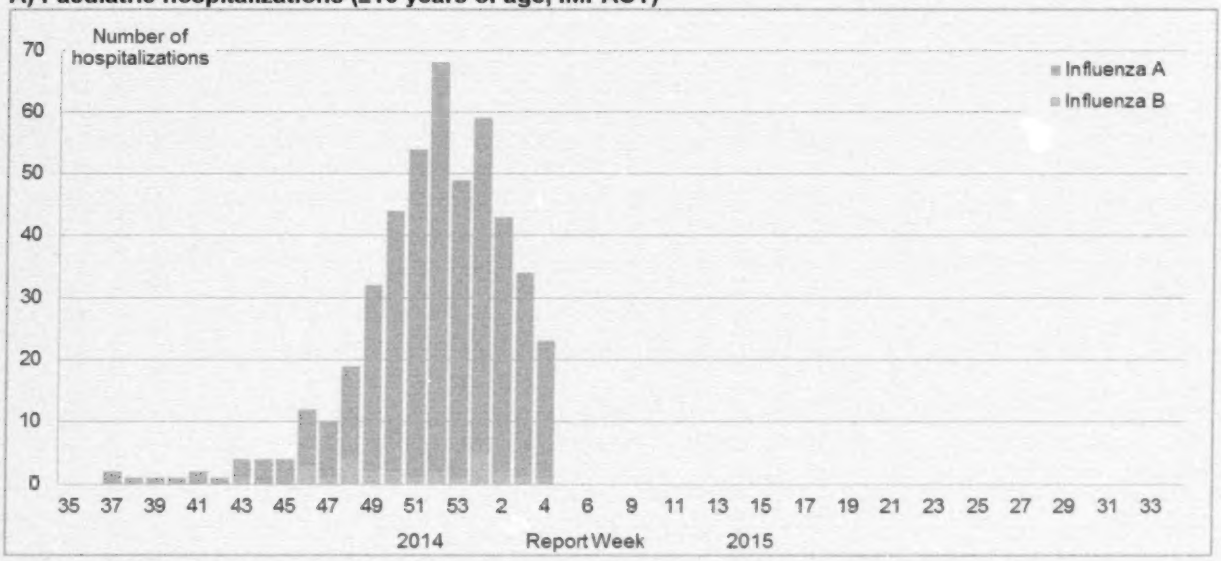
Table 5 – Cumulative numbers of adult hospitalizations with influenza reported by the PCIRN-SOS network, Canada, 2014-15

Age groups (years)	Cumulative (15 Nov. 2014 to 31 Jan. 2015)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
16-20	3	0	0	3	0	3 (%)
20-44	80	1	27	52	1	81 (6%)
45-64	150	0	63	87	2	152 (11%)
65+	1159	2	380	777	16	1175 (83%)
Total	1392	3	470	919	19	1411
%	99%	0%	34%	66%	1%	100%

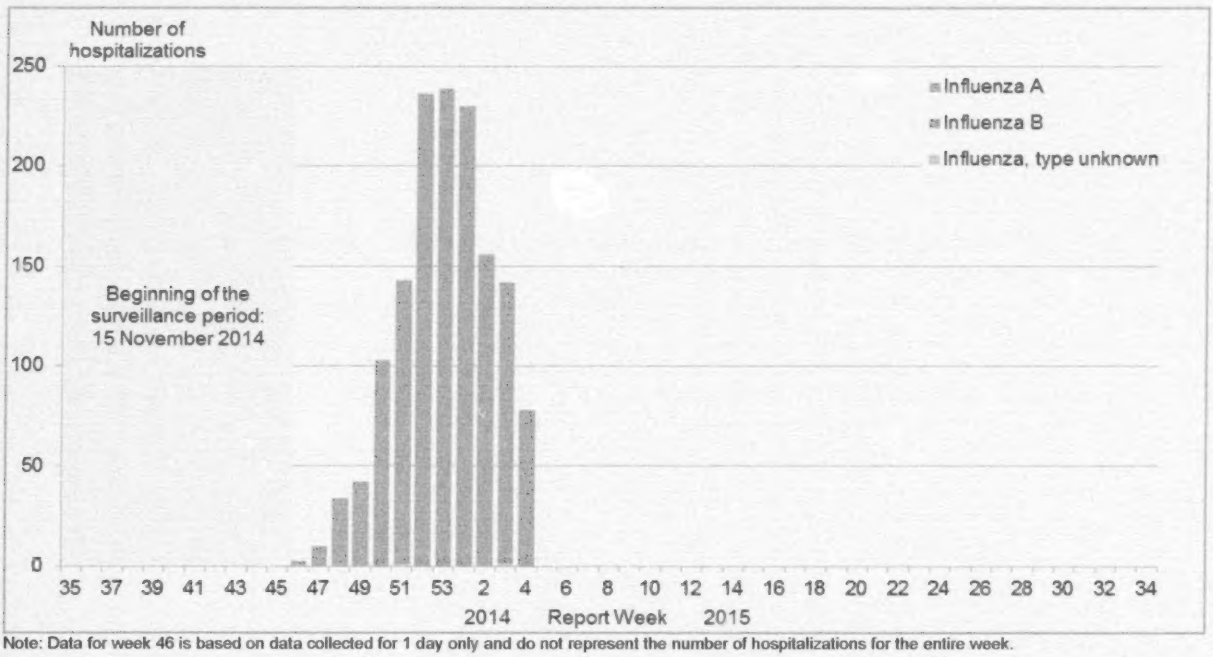
[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections. UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Figure 8 – Number of cases of influenza reported by sentinel hospital networks, by week, Canada, 2014-15

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



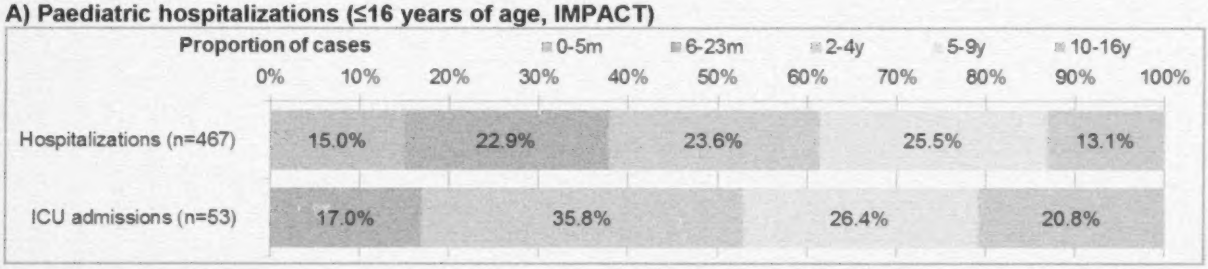
B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



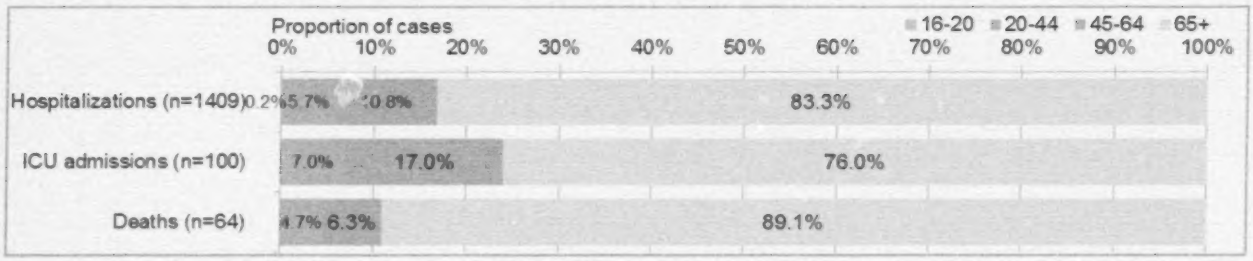
Note: Data for week 46 is based on data collected for 1 day only and do not represent the number of hospitalizations for the entire week.

Figure 9 – Percentage of hospitalizations, ICU admissions and deaths with influenza reported by age-group, Canada, 2014-15

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



Provincial/Territorial Influenza Hospitalizations and Deaths

In week 04, 345 laboratory-confirmed influenza-associated hospitalizations were reported from participating provinces and territories*; all but six with influenza A, and 75% were patients ≥65 years of age. Since the start of the 2014-15 season, 4,079 hospitalizations have been reported; 4,001 (98%) with influenza A. Among cases for which the subtype of influenza A was reported, 99.7% (1930/1935) were A(H3N2). The majority of cases (71%) were ≥65 years of age (Table 6). A total of 120 ICU admissions have been reported in adults ≥65 years of age with influenza A and 63 ICU admissions have been reported in adults 20-64 years. A total of 275 deaths have been reported since the start of the season: three children <5 years of age, two children 5-19 years, 19 adults 20-64 years, and 251 adults ≥65 years of age. Adults 65 years of age or older represent 91% of all deaths reported this season. Detailed clinical information (e.g. underlying medical conditions) is not known for these cases.

* Note: Influenza-associated hospitalizations are not reported to PHAC by the following Provinces and Territory: BC, NU, QC, and NB. Only hospitalizations that require intensive medical care are reported by Saskatchewan. ICU admissions are not distinguished among hospital admissions reported from Ontario. Data may also include cases reported by the IMPACT and PCIRN networks. The number of new influenza-associated hospitalizations and deaths reported for the current week may include cases from Ontario that occurred in previous weeks, as a result of retrospective updates to the cumulative total. It is important to note that the hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting.

Table 6 – Cumulative number of hospitalizations with influenza reported by the participating provinces and territories, Canada, 2014-15

Age groups (years)	Cumulative (24 Aug. 2014 to 31 Jan. 2015)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-4	285	2	110	173	4	289 (7%)
5-19	190	0	98	92	5	195 (5%)
20-44	200	1	109	90	7	207 (5%)
45-64	419	2	209	208	13	432 (11%)
65+	2855	0	1354	1501	45	2900 (71%)
Unknown	52	0	50	2	4	56 (1%)
Total	4001	5	1930	2066	78	4079
Percentage[1]	98.1%	0.1%	48.2%	51.6%	1.9%	100.0%

[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

See additional data on Reported Influenza Hospitalizations and Deaths in Canada: 2009-10 to 2014-15 on the Public Health Agency of Canada website.

Emerging Respiratory Pathogens

Human Avian Influenza

Influenza A(H7N9): On January 26, 2015, the first imported human case of avian influenza A (H7N9) from China was confirmed in Canada. A second case was confirmed on January 29, 2015. They traveled together to China and recently returned to Canada. All evidence regarding the Canadian cases indicates they were likely infected following exposure in China. They were not symptomatic during travel and only became ill after arrival in Canada. These are the first documented cases of H7N9 infection in humans in North America. The risk to Canadians of getting sick with H7N9 remains very low as evidence suggests that it does not transmit easily from person-to-person.

Since the last FluWatch report, one new laboratory-confirmed case of human infection with avian influenza A(H7N9) virus was reported by the World Health Organization. Globally to February, 3 2015, the WHO reported a total of 486 laboratory-confirmed human cases with avian influenza A(H7N9) virus, including 185 deaths.
Documents related to the public health risk of influenza A(H7N9), as well as guidance for health professionals and advice for the public is updated regularly on the following websites:
PHAC – Avian influenza A(H7N9)
WHO – Avian Influenza A(H7N9)

Influenza A(H5N6): Since the last FluWatch report, no new cases of human infection with avian influenza A (H5N6) virus from China has been reported by the World Health Organization. Globally to February 3, 2015, the WHO has been informed of a total of two cases of avian influenza A (H5N6) virus, including one death.

Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

Since the last FluWatch report, 9 new laboratory-confirmed cases of MERS-CoV have been reported by the World Health Organization. Globally, from September 2012 to February 3, 2015, the WHO has been informed of a total of 965 laboratory-confirmed cases of infection with MERS-CoV, including 357 deaths. All cases have either occurred in the Middle East or have had direct links to a primary case infected in the Middle East. The public health risk posed by MERS-CoV in Canada remains low (see the PHAC Assessment of Public Health Risk).

Documents related to the public health risk of MERS-CoV, as well as guidance for health professionals and advice for the public is updated regularly on the following websites:
PHAC – Middle East respiratory syndrome coronavirus (MERS-CoV)
WHO – Coronavirus infections

Avian Influenza A(H5)

The Canadian Food Inspection Agency (CFIA) is continuing its investigation into an outbreak of highly pathogenic avian influenza H5N2 virus in British Columbia's Fraser Valley. No new sites have been identified since December 19, 2014. Further information on the outbreak is provided on the following CFIA website.
CFIA - Notifiable Avian Influenza

Enterovirus D68 (EV-D68)

Information related to enterovirus D68, as well as guidance for health professionals and advice for the public is updated regularly on the following website:
PHAC – Non-polio enterovirus

International Influenza Reports

World Health Organization influenza update
World Health Organization FluNet
WHO Influenza at the human-animal interface
Centers for Disease Control and Prevention seasonal influenza report
European Centre for Disease Prevention and Control - epidemiological data
South Africa Influenza surveillance report
New Zealand Public Health Surveillance
Australia Influenza Report
Pan-American Health Organization Influenza Situation Report

FluWatch Definitions for the 2014-2015 Season

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

Influenza-like-illness (ILI): Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

ILI/Influenza outbreaks

Schools: Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI. Note: it is recommended that ILI school outbreaks be laboratory confirmed at the beginning of influenza season as it may be the first indication of community transmission in an area.

Hospitals and residential institutions: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Institutional outbreaks should be reported within 24 hours of identification. Residential institutions include but not limited to long-term care facilities (LTCF) and prisons.

Workplace: Greater than 10% absenteeism on any day which is most likely due to ILI.

Other settings: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case; i.e. closed communities.

Note that reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions.

Influenza/ILI Activity Levels

1 = No activity: no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported

2 = Sporadic: sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†

3 = Localized: (1) evidence of increased ILI* ;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region**†

4 = Widespread: (1) evidence of increased ILI*;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring **in greater than or equal to 50% of the influenza surveillance region**†

Note: ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls.

** More than just sporadic as determined by the provincial/territorial epidemiologist.*

† Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.

This report is available on the Public Health Agency website at the following address: http://www.phac-aspc.gc.ca/fluwatch/index.html.

Ce rapport est disponible dans les deux langues officielles.